

CLAIM AMENDMENTS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) A system for detecting and analyzing chemical and/or biological aerosols in a sample cloud in the air, said system comprising:
  - a radiation source, said radiation source directing a radiation beam towards the cloud, said radiation beam heating the cloud to raise the temperature of the cloud relative to its background; and
  - a spectrum analysis device responsive to emissions from the cloud, said spectrum analysis device generating an emission spectrum of the chemical and/or biological aerosols in the cloud from the emissions.
2. (Original) The system according to claim 1 wherein the spectrum analysis device is a spectrometer.
3. (Original) The system according to claim 2 wherein the spectrometer is selected from the group consisting of Fourier transform infrared spectrometers, grating tuned spectrometers, opto-acoustic spectrometers, circularly variable filter spectrometers, linear variable spectrometers and MEMS spectrometers.
4. (Original) The system according to claim 1 wherein the spectrum analysis device is a spectral imager.

5. (Original) The system according to claim 1 wherein the radiation source is selected from the group consisting of a microwave radiation source, a millimeter-wave radiation source, a CO<sub>2</sub> laser, an HF laser, a DF laser, a solid-state laser and a fiber laser.

6. (Original) The system according to claim 1 further comprising a beam expander telescope, said beam expander telescope receiving and expanding the radiation beam before it radiates the sample cloud.

7. (Original) The system according to claim 1 further comprising a receiving telescope, said receiving telescope being responsive to the emissions from the cloud and focusing the emissions on the spectrum analysis device.

8. (Currently Amended) A system for detecting and analyzing chemical or biological aerosols, said system comprising:

a chamber for holding the aerosol, said chamber including a first end and a second end, said first end having a first window;

a radiation source, said radiation source generating and directing a radiation beam through the first window to heat the aerosol within the chamber; and

a spectrum analysis device positioned relative to the first end of the chamber, said spectrum analysis device being responsive to emissions from the sample aerosol emitted through the first window, said spectrum analysis device generating an emission spectrum of the aerosol.

9. (Original) The system according to claim 8 wherein the first window is a high transmission window selected from the group consisting of polished salt windows, zinc selenide windows and other suitable windows having anti-reflective coatings.

10. (Original) The system according to claim 8 wherein the sample chamber includes at least one fan for agitating a powder into the aerosol.

11. (Original) The system according to claim 8 wherein the spectrum analysis device is a spectrometer.

12. (Original) The system according to claim 11 wherein the spectrometer is selected from the group consisting of Fourier transform infrared spectrometers, grating tuned spectrometers, opto-acoustic spectrometers, circularly variable filter spectrometers, linear variable spectrometers and MEMS spectrometers.

13. (Original) The system according to claim 8 wherein the spectrum analysis device is a spectral imager.

14. (Original) The system according to claim 8 wherein the radiation source is selected from the group consisting of a microwave radiation source, a millimeter-wave radiation source, a CO<sub>2</sub> laser, an HF laser, a DF laser, a solid-state laser and a fiber laser.

15 - 20. Cancelled.

21. (New) A system for detecting and analyzing chemical and/or biological aerosol in a sample cloud in the air, said system comprising:

a radiation source, said radiation source directing a radiation beam towards the cloud, said radiation beam having a frequency that is selected to be in resonance with target molecules, water vapor molecules or oxygen molecules in the cloud to cause the molecules to vibrate and increase the temperature of the cloud; and

a spectrometer responsive to emissions from the cloud, said spectrometer generating an emissions spectrum of the chemical and/or biological aerosol in the cloud from the emissions to identify the chemical and/or biological aerosol.

22. (New) The system according to claim 21 wherein the spectrometer is selected from the group consisting of Fourier transform infrared spectrometers, grating tuned spectrometers, opto-acoustic spectrometers, circularly variable filter spectrometers, linear variable spectrometers and MEMS spectrometers.

23. (New) The system according to claim 21 wherein the radiation source is selected from the group consisting of a microwave radiation source, a millimeter-wave radiation source, a CO<sub>2</sub> laser, an HF laser, a DF laser, a solid-state laser and a fiber laser.

24. (New) A system for detecting and analyzing chemical and/or biological aerosols, said system comprising:

a chamber for holding the aerosol, said chamber including a first end and

a second end, said first end having a window;

a radiation source, said radiation source generating and directing a radiation beam through the window, said radiation beam having a wavelength that is in resonance with target molecules, water vapor molecules or oxygen molecules so as to cause the molecules to vibrate and increase the temperature of the aerosol within the chamber; and

a spectrometer positioned relative to the first end of the chamber, said spectrometer being responsive to emissions from the aerosol emitted through the window, said spectrometer generating an emissions spectrum of the aerosols.

25. (New) The system according to claim 24 wherein the spectrometer is selected from the group consisting of Fourier transform infrared spectrometers, grating tuned spectrometers, opto-acoustic spectrometers, circularly variable filter spectrometers, linear variable spectrometers and MEMS spectrometers.

25. (New) The system according to claim 24 wherein the radiation source is selected from the group consisting of a microwave radiation source, a millimeter-wave radiation source, a CO<sub>2</sub> laser, an HF laser, a DF laser, a solid-state laser and a fiber laser.